

ABSTRACT

An slab CO₂ laser includes spaced-apart elongated slab electrodes. A lasing gas fills a discharge gap between the electrodes. An RF power supply is connected across the electrodes and sustains an electrical discharge in the lasing gas in the discharge gap.

5 Either one or two ceramic inserts occupy a portion of width of the electrodes and in contact with the electrodes. A discharge gap is formed between the portions of the width of the electrodes not occupied by the insert or inserts. Provision of the ceramic insert or inserts increases the resistance-capacitance (RC) time constant of the electrode impedance by increasing the capacitive component of the time constant. This hinders

10 the formation of arcs in the discharge, which, in turn enables the inventive laser to operate with higher excitation power or higher lasing-gas pressure than would be possible without the dielectric insert. The ceramic insert also decreases the difference in impedance of the electrodes with and without a discharge. This leads to a better-behaved discharge, and a discharge that is easier to light.